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EXAMINER	
ZERVIGON, RUDY	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/821,310	BERA ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-11,13-16 and 18-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-11,13-16 and 18-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li; Yicheng et al. (US 6448536 B2). Li teaches a semiconductor substrate processing system (Figure 1; column 4, lines 13-33) comprising: a processing chamber (1; Figure 1) a substrate support pedestal (3; Figure 1) disposed in the chamber (1; Figure 1); a gas inlet (21; Figure 1) formed in the chamber (1; Figure 1) above the pedestal (3; Figure 1) for supplying a process gas into a process region (2; Figure 1) above the support pedestal (3; Figure 1); an exhaust port (27a; Figure 1) formed in a wall (1; Figure 1) of the chamber (1; Figure 1) and the restrictor plate (26; Figure 1,2; column 5; lines 35-54) at least partially circumscribing the substrate support pedestal (3; Figure 1) and adapted to control the flow of at least one gas flowing between the process region (2; Figure 1) and the exhaust port (27a; Figure 1), wherein a first predetermined gap (5; Figure 1) is between the substrate support pedestal (3; Figure 1) and the restrictor plate (26; Figure 1,2; column 5; lines 35-54) - claim 23. Li further teaches the system (Figure 1; column 4, lines 13-33) of claim 23, wherein the restrictor plate (26; Figure 1,2; column 5; lines 35-54) further comprises a plurality of removable arc segments – Figure 2 shows element 26 separated at 120° increments, as claimed by claim 24

Li does not teach a restrictor plate (26; Figure 1,2; column 5; lines 35-54) supported within the processing chamber (1; Figure 1) in a laterally spaced-apart relation relative to the substrate support pedestal (3; Figure 1) and sidewalls of the processing chamber (1; Figure 1), and a

second predetermined gap is between the restrictor plate (26; Figure 1,2; column 5; lines 35-54) and the sidewalls of the processing chamber (1; Figure 1) – claim 23.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the dimension(s) of Li's restrictor plate (26; Figure 1,2; column 5; lines 35-54), including adding additional restrictor plate (26; Figure 1,2; column 5; lines 35-54) hole(s) (25; Figure 1) to the perimeter of Li's restrictor plate (26; Figure 1,2; column 5; lines 35-54) providing a second predetermined gap.

Motivation to optimize the dimension(s) of Li's restrictor plate (26; Figure 1,2; column 5; lines 35-54) including adding additional restrictor plate (26; Figure 1,2; column 5; lines 35-54) hole(s) (25; Figure 1) to the perimeter of Li's restrictor plate (26; Figure 1,2; column 5; lines 35-54) providing a second predetermined gap is for controlling exhaust flow across 26 as taught by Li (column 5; lines 27-35).

3. Claims 1-3, 5, 6, 9-11, 14-16, 18, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komino; Mitsuaki et al. (US 6,156,151 A) in view of Yonenaga; Tomihiro et al. (US 5972114 A). Komino teaches Apparatus (Figure 1; column 3, line 60 - column 4, line 54) for controlling the flow of a gas between a process region (101; Figure 1) and an exhaust port (112a, 2; Figure 1) in a semiconductor substrate processing chamber (CC; Figure 1,4), comprising; at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) supported within the semiconductor processing chamber (CC; Figure 1,4) and adapted to at least partially circumscribe a substrate support pedestal (114; Figure 1, 4), the restrictor plate (118; Figures 2-4, column 6, lines 26-41) adapted to control the flow of at least one gas flowing between the process region (101; Figure 1) and the exhaust port (112a, 2; Figure 1), as claimed by claim 1

Komino further teaches:

i. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 1, further comprising: a base (LC; Figure 1) adapted to be coupled to a bottom of the processing chamber (CC; Figure 1,4); and a support ring (111b; Figure 1,2) coupled to the base (LC; Figure 1) in a vertically spaced apart orientation, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) is coupled to the support ring (111b; Figure 1,2), as claimed by claim 2

ii. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 1, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) having an annular shape which at least partially circumscribes the substrate support pedestal (114; Figure 1, 4), as claimed by claim 6

iii. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 1, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) further comprises a plurality of restrictor plates (118; Figures 2-4, column 6, lines 26-41), wherein each restrictor plate (118; Figures 2-4, column 6, lines 26-41) abuts at least one other restrictor plate (118; Figures 2-4, column 6, lines 26-41), as claimed by claim 9

iv. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 10, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) is a plurality of restrictor plates (118; Figures 2-4, column 6, lines 26-41) having an arcuate shape, as claimed by claim 14

v. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 14, wherein the plurality of restrictor plates (118; Figures 2-4, column 6, lines 26-41) substantially surround the substrate support pedestal (114; Figure 1, 4), as claimed by claim 15

vi. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 15, wherein at least a portion of an outer edge of the plurality of restrictor plates (118; Figures 2-4, column 6, lines 26-41) reduces a gap defined between the outer edge and an inner wall of the chamber (CC; Figure 1,4) proximate the exhaust port (112a, 2; Figure 1), as claimed by claim 16

vii. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 10, wherein the one restrictor plate (118; Figures 2-4, column 6, lines 26-41) has an annular shape which substantially surrounds the substrate support pedestal (114; Figure 1, 4), as claimed by claim 18

Komino does not teach a plurality of support pins supporting Komino's restrictor plate (118; Figures 2-4, column 6, lines 26-41) as claimed by claim 1.

Komino further does not teach:

i. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 2, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) is configured to be laterally spaced apart from the substrate support pedestal (114; Figure 1, 4) and an interior wall of the processing chamber (CC; Figure 1,4), as claimed by claim 3

ii. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 3, wherein the support pins (113, 116; Figure 2) retain the supporting ring (111b; Figure 1,2) in a non-

parallel orientation with respect to a plane defined by a substrate support (114; Figure 1, 4) surface of the substrate support pedestal (114; Figure 1, 4), as claimed by claim 5

iii. A semiconductor substrate processing system (Figure 1; column 3, line 60 - column 4, line 54) comprising: a processing chamber (CC; Figure 1,4); a substrate support pedestal (114; Figure 1, 4) disposed in the chamber (CC; Figure 1,4); a gas inlet (106; Figure 2) formed in the chamber (CC; Figure 1,4) above the pedestal (114; Figure 1, 4) for supplying a process gas into a process region (101; Figure 1) above the support pedestal (114; Figure 1, 4); an exhaust port (112a, 2; Figure 1) formed in a wall of the chamber (CC; Figure 1,4) and at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) supported within the processing chamber (CC; Figure 1,4) by a plurality of support pins and at least partially circumscribing the substrate support pedestal (114; Figure 1, 4) , the restrictor plate (118; Figures 2-4, column 6, lines 26-41) adapted to control the flow of at least one gas flowing beetween the process region (101; Figure 1) and the exhaust port (112a, 2; Figure 1), as claimed by claim 10

iv. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 10, further comprising: a base (LC; Figure 1) adapted to be coupled to a bottom of the processing chamber (CC; Figure 1,4); and a support ring (111b; Figure 1,2) coupled to the base (LC; Figure 1) via a plurality of support pins in a vertically spaced apart orientation wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) is coupled to the support ring (111b; Figure 1,2), as claimed by claim 11

v. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 23 further comprising: a plurality of support pins coupling the restrictor plate (118; Figures 2-4,

column 6, lines 26-41) to a bottom of the processing chamber (CC; Figure 1,4), as claimed by claim 25

vi. The apparatus of claim 1, wherein a length of the support pins is adjustable, as claimed by claim 26

vii. The apparatus of claim 1, wherein the restrictor plate (118; Figures 2-4, column 6, lines 26-41) has an oval profile, as claimed by claim 27

viii. A semiconductor substrate processing system, comprising: a processing chamber (CC; Figure 1,4); a substrate support pedestal (114; Figure 1, 4) disposed in the processing chamber (CC; Figure 1,4); a gas inlet (106; Figure 2) formed in the processing chamber (CC; Figure 1,4) above the pedestal for supplying a process gas into a process region (101; Figure 1) defined in the processing chamber (CC; Figure 1,4) above the support pedestal (114; Figure 1, 4); an exhaust port (112a, 2; Figure 1) formed in a wall of the processing chamber (CC; Figure 1,4); a restrictor plate (118; Figures 2-4, column 6, lines 26-41) supported within the processing chamber (CC; Figure 1,4) in a laterally space-apart relation relative to the support pedestal (114; Figure 1, 4) and sidewalls of the processing chamber (CC; Figure 1,4), the restrictor plate (118; Figures 2-4, column 6, lines 26-41) at least partially circumscribing the substrate support pedestal (114; Figure 1, 4) and positioned above the exhaust port (112a, 2; Figure 1); and a plurality of pins extending between the restrictor plate (118; Figures 2-4, column 6, lines 26-41) and a bottom of the processing chamber (CC; Figure 1,4), as claimed by claim 28

ix. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 1, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) is supported within the

processing chamber (CC; Figure 1,4) in a laterally spaced-apart relation (118b; Figure 1) relative to the substrate support pedestal (114; Figure 1, 4) and sidewalls of the processing chamber (CC; Figure 1,4), and a first predetermined gap (118b; Figure 1) is between the substrate support pedestal (114; Figure 1, 4) and the restrictor plate (118; Figures 2-4, column 6, lines 26-41), and a second predetermined gap is between the restrictor plate (118; Figures 2-4, column 6, lines 26-41) and the sidewalls of the processing chamber (CC; Figure 1,4), as claimed by claim 29

x. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 10, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) is supported within the processing chamber (CC; Figure 1,4) in a laterally spaced-apart relation (118b; Figure 1) relative to the substrate support pedestal (114; Figure 1, 4) and sidewalls of the processing chamber (CC; Figure 1,4), and a first predetermined gap (118b; Figure 1) is between the substrate support pedestal (114; Figure 1, 4) and the restrictor plate (118; Figures 2-4, column 6, lines 26-41), and a second predetermined gap is between the restrictor plate (118; Figures 2-4, column 6, lines 26-41) and the sidewalls of the processing chamber (CC; Figure 1,4), as claimed by claim 30

Yonenaga teaches a plurality of support pins ("column" – see plural 48 Figure 1, column 4, lines 4-17) supporting Komino's restrictor plate (46; Figure 1, column 4, lines 4-17) including

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Yonenaga's support pins to Komino's restrictor plate (118; Figures 2-4, column 6, lines 26-41), including adding additional restrictor plate (118; Figures 2-4, column 6, lines 26-41)

hole(s) (118a; Figure 1) to the perimeter of Komino's restrictor plate (118; Figures 2-4, column 6, lines 26-41) providing a second predetermined gap.

Motivation to add Yonenaga's support pins to Komino's restrictor plate, including adding additional restrictor plate (118; Figures 2-4, column 6, lines 26-41) hole(s) (118a; Figure 1) to the perimeter of Komino's restrictor plate (118; Figures 2-4, column 6, lines 26-41) providing a second predetermined gap is for adding additional support means in addition to Komino's support means (118b; Figure 2) and for influencing exhaust flow pressures as taught by Komino (column 6; lines 43-51).

4. Claims 7, 8, 13, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komino; Mitsuaki et al. (US 6,156,151 A) in view of Yonenaga; Tomihiro et al. (US 5972114 A). Komino is discussed above. Komino does not teach:

i. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 6, wherein the restrictor plate (118; Figures 2-4, column 6, lines 26-41) has a width that is wider at one portion of the restrictor plate (118; Figures 2-4, column 6, lines 26-41) than at another portion of the restrictor plate (118; Figures 2-4, column 6, lines 26-41), as claimed by claim 7

ii. The apparatus (Figure 1; column 3, line 60 - column 4, line 54) of claim 7, wherein the portion having the wider width is adapted for positioning proximate the exhaust port (112a, 2; Figure 1), as claimed by claim 8

iii. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 11, wherein the support pins (113, 116; Figure 2) retain the substrate supporting ring (111b; Figure 1,2)

non-parallel with respect to a plane defined by a support surface of the substrate support pedestal (114; Figure 1, 4), as claimed by claim 13

iv. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 18, wherein the one restrictor plate (118; Figures 2-4, column 6, lines 26-41) has a width that is wider at one portion of the one restrictor plate (118; Figures 2-4, column 6, lines 26-41) than at another portion of the one restrictor plate (118; Figures 2-4, column 6, lines 26-41), as claimed by claim 19

v. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 19, wherein the portion having the wider width is positioned proximate the exhaust port (112a, 2; Figure 1), as claimed by claim 20

vi. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 20, wherein at least a portion of an outer edge of the one restrictor plate (118; Figures 2-4, column 6, lines 26-41) reduces a gap defined between the outer edge and an inner wall of the chamber (CC; Figure 1,4) along one section proximate the exhaust port (112a, 2; Figure 1), as claimed by claim 21

vii. The system (Figure 1; column 3, line 60 - column 4, line 54) of claim 10, wherein the at least one restrictor plate (118; Figures 2-4, column 6, lines 26-41) is one restrictor plate (118; Figures 2-4, column 6, lines 26-41) having an annular shape which completely surrounds the substrate support pedestal (114; Figure 1, 4) and a width that is wider at one portion of the one restrictor plate (118; Figures 2-4, column 6, lines 26-41) than at another portion of the one restrictor plate (118; Figures 2-4, column 6, lines 26-41), and wherein a portion of an outer edge of the one restrictor plate (118; Figures 2-4, column 6,

lines 26-41) contacts an inner wall of the chamber (CC; Figure 1,4) at least in a location proximate the exhaust port (112a, 2; Figure 1), as claimed by claim 22

Yonenaga is discussed above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the dimensions of Komino's apparatus parts restrictor plate (118; Figures 2-4, column 6, lines 26-41), and support pins (113, 116; Figure 2), further, adding additional restrictor plate (118; Figures 2-4, column 6, lines 26-41) hole(s) (118a; Figure 1) to the perimeter of Komino's restrictor plate (118; Figures 2-4, column 6, lines 26-41) providing a gap defined between the outer edge and an inner wall of the chamber.

Motivation to optimize the dimensions of Komino's apparatus parts restrictor plate (118; Figures 2-4, column 6, lines 26-41), and support pins (113, 116; Figure 2), further, adding additional restrictor plate (118; Figures 2-4, column 6, lines 26-41) hole(s) (118a; Figure 1) to the perimeter of Komino's restrictor plate (118; Figures 2-4, column 6, lines 26-41) providing a gap defined between the outer edge and an inner wall of the chamber is for influencing process as flow characteristics of Komino's apparatus as taught by Komino (column 1; lines 51-61; column 6; lines 43-51). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

Response to Arguments

5. Applicant's arguments with respect to claims 23, 29, and 30 are have been considered but are moot in view of the new grounds of rejection.

6. Applicant's arguments and claim amendments are persuasive and have thus acted to removed the Examiner's prior 102(b) rejection. Arguments based thereon are considered moot.

7. Applicant's arguments with respect to claim 23 are based on the claim amendments filed in response to the prior action. The Examiner has proposed new grounds of rejection based on Applicant's amendments to claim 23. Arguments based thereon are considered moot.

8. Applicant's arguments with respect to claims 1-3, 5, 6, 9-11, 14-16, 18, and 25-28 is also moot in view of the new grounds of rejection necessitated by Applicant's claim amendments.

9. Applicant's arguments with respect to claims 7, 8, 13, and 19-22 is also moot in view of the new grounds of rejection necessitated by Applicant's claim amendments.

Conclusion

10. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.